WHAT IS CLAIMED IS:

1. A fiber optic gyroscope in which light from a light source is entered through an optical fiber and a fiber optic coupler into a substrate type optical integrated circuit having a function of a polarizer and a branching optical waveguide, light waves branched in the optical integrated circuit are entered into both ends of a fiber optic coil as a clockwise light and a counterclockwise light respectively, the clockwise light and the counterclockwise light having propagated through the fiber optic coil are coupled to each other in the optical integrated circuit thereby to interfere both light waves with each other, the interference light is entered into a photodetector through the fiber optic coupler to convert the intensity thereof to an electric signal, and an angular velocity applied to the fiber optic coil about the axis thereof is detected from the electric signal, said fiber optic gyroscope comprising:

a polarization maintaining optical fiber having its length L connected to an input/output end of the optical integrated circuit nearer the light source in an optical system of optical fiber from the light source to the optical integrated circuit, said polarization maintaining optical fiber of its length L resulting in a difference in group delay time between the orthogonal two polarization modes and said difference at least exceeding a coherence length of light from the light source;

an optical system of optical fiber from the light source to the optical integrated circuit except for the polarization maintaining optical fiber of its length L, that is constructed by a single mode optical fiber; and

the fiber optic coupler that is constructed by a single mode optical fiber.

2. The fiber optic gyroscope as set forth in claim 1, wherein the branching optical waveguide of the optical integrated circuit and the polarization maintaining optical fiber of its length L are connected with each other in the state that the branching optical waveguide and the polarization maintaining optical fiber of its

length L are aligned with each other so that the TM mode axis of the branching optical waveguide coincides with the slow axis of the polarization maintaining optical fiber of its length L.

3. The fiber optic gyroscope as set forth in claim 1, wherein the fiber optic coil is constructed by a single mode optical fiber, a first and a second polarization maintaining optical fibers are connected to both ends of the coil respectively, the two polarization maintaining optical fibers are connected to the branching optical waveguide of the optical integrated circuit in the axis rotation method in the state that the polarization axis of each polarization maintaining optical fiber and the polarization axis of the corresponding branching optical waveguide are placed at an angle of 45 degrees, the first polarization maintaining optical fiber has its length at least longer than 2L, and the second polarization maintaining optical fiber has its length at least longer than 4L.

4. The fiber optic gyroscope as set forth in claim 2, wherein the fiber optic coil is constructed by a single mode optical fiber, a first and a second polarization maintaining optical fibers are connected to both ends of the coil respectively, the two polarization maintaining optical fibers are connected to the branching optical waveguide of the optical integrated circuit in the axis rotation method in the state that the polarization axis of each polarization maintaining optical fiber and the polarization axis of the corresponding branching optical waveguide are placed at an angle of 45 degrees, the first polarization maintaining optical fiber has its length at least longer than 2L, and the second polarization maintaining optical fiber has its length at least longer than 4L.